

## CHROMAFLAIR® CROW BUSTER FOR REPELLING BLACKBIRDS AND CROWS

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**Abstract:** Nonlethal alternatives are needed to manage emerging and sustained conflicts between humans and several wild birds. We evaluated the ChromaFlair® “Crow Buster,” a device developed in Japan to repel Asian crows from garbage cans, fruit trees, and utility structures. The Crow Buster consists of a strip (1.5-3.5 cm wide) of stiff, shiny plastic cut into a spiral shape. The device is iridescent green-purple in color. We conducted 2 studies to determine the influence of the Crow Buster on the foraging distribution of red-winged blackbirds (*Agelaius phoeniceus*) and American crows (*Corvus brachyrhynchos*) in captivity. For both bird species, we conducted a study in 6 flight pens (35 blackbirds or 5 crows in each 0.07 ha pen) during 3 weeks, including a pretreatment (Crow Buster absent), test (Crow Buster present), and posttest period (Crow Buster absent). We measured daily food consumption in each of 12 bowls (per pen) placed 5 m, 10 m, or 15 m from a vertical post used to suspend the Crow Buster. We observed no difference in the foraging distribution of blackbirds associated with or without the Crow Buster bird repellent. The ChromaFlair Crow Buster repelled captive American crows only during the first day of the test, and only up to 10 m from the suspended device. The ineffectiveness of the Crow Buster for repelling red-winged blackbirds and American crows is also likely under field conditions, where most applications would require efficacy for at least several days and at distances greater than 10 m.

**Key words:** *Agelaius phoeniceus*, American crow, avian repellent, *Corvus brachyrhynchos*, red-winged blackbird

Proceedings of the 12<sup>th</sup> Wildlife Damage Management Conference (D.L. Nolte, W.M. Arjo, D.H. Stalman, Eds). 2007

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### INTRODUCTION

Several blackbird (Icteridae) species are abundant summer residents and migrants in central and southern regions of North America (Meanley 1971, Dolbeer 1978), including red-winged blackbirds (*Agelaius phoeniceus*). After breeding, blackbirds aggregate in large flocks that feed on agricultural crops. The flocking behavior continues from late summer into early spring.

Blackbirds can cause economic losses during this period to seeded and ripening rice in the southern regions of North America (Cummings et al. 2002, 2005). Direct economic losses of blackbird depredation to the U.S. rice crop have been estimated at \$21.5 million (USD, per annum) by Cummings et al. (2005). These losses have motivated use of various bird damage management practices by rice producers,

including avian repellents.

The 2001 Research Needs Assessment of the National Wildlife Research Center (NWRC) revealed the priority for Icterid and Corvid damage management research. Specific research needs include the development of new and improved methods (e.g., repellents) to mitigate the impacts of blackbirds and crows (Bruggers et al. 2002). We evaluated a novel bird repellent for altering the foraging behavior of red-winged blackbirds and American crows (*Corvus brachyrhynchos*) in captivity.

We evaluated the ChromaFlair “Crow Buster,” a device developed in Japan to repel Asian crows from garbage cans, fruit trees, and utility structures. The Crow Buster consists of a strip (1.5-3.5 cm wide) of stiff, shiny plastic-like material cut into a spiral shape. When the Crow Buster is suspended vertically, it extends downward approximately 0.75 m, becoming progressively broader (approximately 3 cm diameter at the top to 20 cm at the bottom). ChromaFlair (i.e., multi-layered) pigments make the device iridescent green-purple in color. We suspended the ChromaFlair Crow Buster so that it twisted and turned in the wind within our experimental flight pens.

## STUDY AREA

We conducted our studies at the United States Department of Agriculture’s National Wildlife Research Center in Fort Collins, Colorado. The studies were conducted in each of 6 flight pens (each 18 m × 40 m, 0.4 ha total) at the NWRC outdoor animal research facility. Each pen contained 2 shelters (northwest and northeast corners) and one water bowl (centered on west fence of each pen).

## METHODS

### Blackbird study

We investigated the influence of the Crow Buster bird repellent on the foraging distribution of red-winged blackbirds in captivity. We established a vertical post (2.5 m tall) in the center of each flight pen. We extended (horizontally) a 0.75 m arm from the top of each center post. We placed one food bowl at each of 5 m, 10 m, and 15 m from the center post, extending in each of 4 directions: NW, NE, SE, and SW. Thus, there were 12 food bowls in each pen.

The study consisted of 3, 4-day periods: pretreatment (Crow Buster absent), test (Crow Buster present), and posttest (Crow Buster absent). We populated each pen with 35 red-winged blackbirds prior to the pretreatment. We suspended the Crow Buster device (one per pen, 1.75 m above ground) from a rotating swivel on the horizontal arm during the test. We offered daily a maintenance diet (2 parts millet: 1 milo: 1 safflower: 1 sunflower) to all blackbirds throughout the study. We measured daily food consumption ( $\pm 1.0$  g) in each bowl to determine foraging distribution in the presence and absence of the Crow Buster bird repellent.

The dependent measure for the blackbird study was average food consumption among bowls placed at varying distances from the center of each flight pen. We used descriptive statistics ( $\bar{x} \pm SE$ ) to summarize consumption during the pretreatment, test, and posttest. We separated the means of bowl distances (i.e., 5 m, 10 m, 15 m from the center of each pen) using non-overlapping confidence intervals for each study day. The NWRC Institutional Animal Care and Use Committee approved the capture, care, and use of animals associated with our captive studies

### **Crow study**

We investigated the influence of the Crow Buster bird repellent on the foraging distribution of captive American crows. We again used 6, 0.07 ha flight pens for the crow study, and repeated all pretreatment (Crow Buster absent), test (Crow Buster present), and posttest (Crow Buster absent) procedures of the blackbird study. One Crow Buster device was suspended (0.75 m above ground, per manufacturer recommendation) from a rotating swivel on the horizontal arm in each pen during the test.

We populated each pen with 5 American crows. We offered daily a maintenance diet (dry dog food) to all crows, and again measured daily food consumption to determine foraging distribution in the presence and absence of the Crow Buster bird repellent. We used descriptive statistics ( $\bar{x} \pm \text{SE}$ ) to summarize average consumption during the pretreatment, test, and posttest. We separated the means of bowl distances (i.e., 0 m [test and posttest only, per manufacturer recommendation], 5 m, 10 m, 15 m from the center of each pen) using non-overlapping confidence intervals for each study day.

## **RESULTS**

### **Blackbird study**

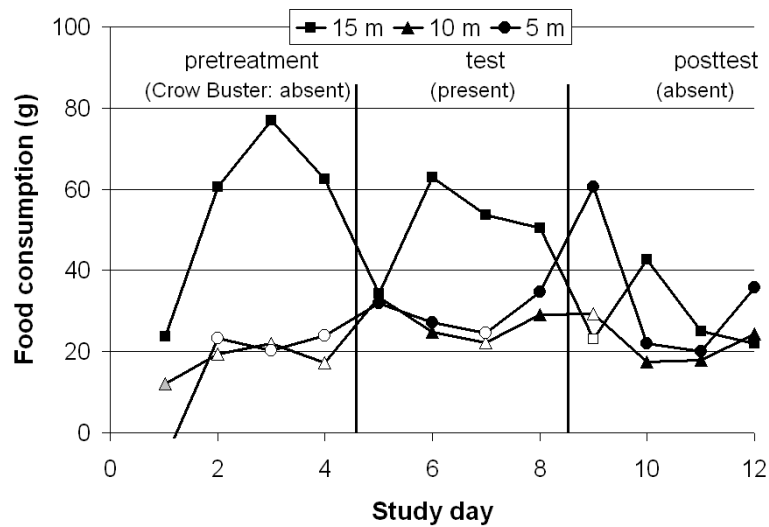
Red-winged blackbirds consumed more food from bowls at 15 m than those placed 5 m from the center of the pen during the first day of the pretreatment (Figure 1). Blackbirds consumed more food from bowls positioned 15 m from the pen center than those at 5 m and 10 m during pretreatment days 2–4. We observed no difference in food consumption among bowls at 5 m, 10 m, and 15 m during test days 1, 2, and 4 (i.e., Crow

Buster present). More food was consumed at 15 m than at other distances during test day 3.

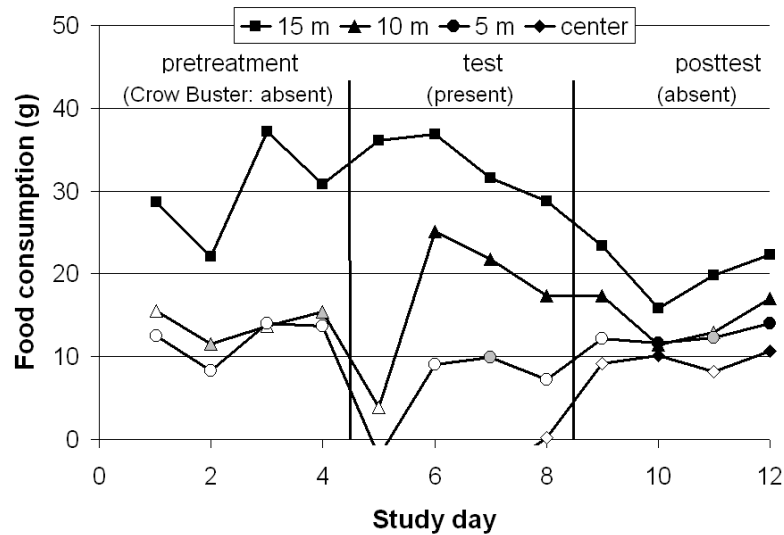
Blackbirds consumed most food from the 5 m bowls during day 1 of the posttest. Else, food consumption did not differ among bowl distances during the posttest (Figure 1). We repeatedly observed blackbirds perching on center posts throughout the pretreatment period. We also observed blackbirds in 2 flight pens perching on center posts ( $< 0.5$  m from the Crow Buster) within 30 min of introducing the Crow Buster device during day 1 of the test. These observations were repeated among pens throughout the test. Relative to the pretreatment, the Crow Buster did not repel blackbirds from the center of our flight pens or decrease food consumption near the Crow Buster device.

### **Crow study**

American crows consumed more food from bowls at 15 m than those placed 5 m and 10 m from the center of the pen during pretreatment days 1 and 3 (Figure 2). Crows consumed more food from bowls positioned 15 m from the pen center than those at 5 m during pretreatment days 2 and 4. The Crow Buster decreased food consumption at  $\leq 10$  m from the device during the first day of the test. During test days 2 to 4, however, consumption did not differ at 10 m and 15 m from the Crow Buster. Unlike all other pretreatment and test days, we observed some food consumption from the center bowl placed 0.75 m beneath the Crow Buster in one flight pen on test day 4 (Figure 2). Unlike blackbirds, crows did not perch on the horizontal arms during the study. Crows were most often observed loafing on shelter roofs, feeding, or flying within our flight pens.



**Figure 1.** Food consumption ( $\bar{x} \pm \text{SE}$ ) among red-winged blackbirds ( $n = 35$  in each of 6, 0.07 ha flight pens) used to evaluate the ChromaFlair® Crow Buster repellent device at the National Wildlife Research Center in Fort Collins, Colorado, November 2006. The study included 3, 4-day periods: pretreatment, test, posttest. Consumption data were collected at 5 m, 10 m, and 15 m from the center of each pen where the Crow Buster device was suspended during the test. Black and white data indicate non-overlapping confidence intervals for each study day.



**Figure 2.** Food consumption ( $\bar{x} \pm \text{SE}$ ) among American crows ( $n = 5$  in each of 6, 0.07 ha flight pens) used to evaluate the ChromaFlair® Crow Buster repellent device at the National Wildlife Research Center in Fort Collins, Colorado, February 2007. The study included 3, 4-day periods: pretreatment, test, posttest. Consumption data were collected at 5 m, 10 m, and 15 m from the center of each pen where the Crow Buster device was suspended during the test. One food bowl was included at the center of each pen during the test and posttest periods. Black and white data indicate non-overlapping confidence intervals for each study day.

## DISCUSSION

The Crow Buster was previously evaluated via controlled experiments with European starlings (*Sturnus vulgaris*) and monk parakeets (*Myiopsitta monachus*). Seamans and Helon (2006) evaluated the Crow Buster as a nesting deterrent for starlings. They observed no difference in the presence of nesting material in nest boxes with and without the Crow Buster. Although the clutch size was similar between nest boxes with and without the Crow Buster, the mean initial date of egg laying was delayed 6 days among treated (Crow Buster present) boxes. Monk parakeets displayed no aversive reaction to the Crow Buster in captivity (Avery and Keacher, unpublished data).

The dynamic coloration and movement of the ChromaFlair Crow Buster presumably enhance its avian repellency. However, several Crow Busters became entangled upon themselves during our studies, thus limiting subsequent movement and color change. The constant presence of the device may promote habituation of its initial repellency, or novelty. Motion-activated hazing systems may be more effective at mitigating wildlife damage than continuous (e.g., Crow Buster), manually-activated, periodic, and random-delivery repellent systems (Werner and Clark 2006). Further development of motion-activated hazing systems, and the integration of dynamic and species-specific coloration in avian repellent applications are warranted.

Repellency of the ChromaFlair Crow Buster in our captive studies was limited to the first day of the American crow test at up to 10 m from the suspended device. Thus, the Crow Buster did not effectively alter the foraging distribution of captive blackbirds or crows during our studies. The Crow Buster is currently valued at \$30–\$40 per device

(USD), depending upon the thickness of plastic used for its fabrication (Max Yoshida, CBC America Corp., personal communication). The manufacturer recommends 3 to 4 devices per tree to minimize depredation of fruit crops by Asian crows. Whereas most applications of bird damage management require efficacy for at least several days and at distances greater than 10 m, we conclude that the Crow Buster will not cost-effectively manage conflicts associated with red-winged blackbirds or American crows.

## ACKNOWLEDGMENTS

This study was partially funded by CBC America Corp. (Torrance, CA) under a Cooperative Service Agreement between CBC America (Cooperator) and National Wildlife Research Center. We thank Mr. Max Yoshida and Mr. Yoshizawa (CBC America Corp.) for providing the ChromaFlair Crow Busters for our studies. We also thank T. W. Seamans and Drs. M. L. Avery and M. E. Tobin for their comments on an earlier version of this manuscript. We appreciate the National Wildlife Research Center animal care staff that provided daily care throughout our feeding experiments. Corporate collaborations do not imply endorsement by the United States Department of Agriculture.

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